ABSTRACT

THE EFFECT OF CARBOXYMETHYL CHITOSAN AND CURCUMIN CONCENTRATION ON PHYSICAL CHARACTERISTICS AND WOUND HEALING ACTIVITY OF CARBOXYMETHYL CHITOSAN-CURCUMIN CARBOMER-BASED HYDROGEL

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Carboxymethyl chitosan is a water-soluble chitin derivative and functional biomaterial which possesses many favorable biological properties such as biocompatibility, biodegradability and bioactivity. Studies have suggested that carboxymethyl chitosan could effectively accelerate wound healing and reduce scar formation. Curcumin is a bioactive that acts as an anti-inflammatory, antibacterial, and antioxidant agent. In order to find innovative ways for administering carboxymethyl chitosan and curcumin, alternative delivery system such as hydrogel dressing has been developed. Hydrogel has high content of water that can provide humid environment to the skin. Humid environment can accelerate wound healing process as the forming of cells happen in humid conditions. Hydrogel has specific characteristics such as organoleptic, viscosity, spreadability, drying time and pH. This study was to determine the effect of different concentration of carboxymethyl chitosan and curcumin on physical characteristics. The results showed that higher concentration of carboxymethyl chitosan could significantly reduce viscosity and pH while its spreading capability and drying time were significantly increased. Curcumin only affected two out of five physical characteristics performed, organoleptic and pH. Higher concentration of curcumin added in the formulation can reduce its pH but the statistic results showed there is no interaction between carboxymethyl chitosan and curcumin. In the wound healing activity test in Wistar rats using burn wound model degree-II, the results indicated that carboxymethyl chitosan-curcumin hydrogel can significantly improve wound healing activity in rats compared to control group.

Keywords : Carboxymethyl chitosan, curcumin, hydrogel dressing, wound healing